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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/965,801	10/01/2001	Toru Suzuki	862.C2398	3395

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FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER

ESPLIN, DAVID B

ART UNIT

PAPER NUMBER

2851

DATE MAILED: 04/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/965,801

Applicant(s)

SUZUKI, TORU

Examiner

D. Ben Esplin

Art Unit

2851

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 February 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-4, 7-10 and 13-19 is/are allowed.
- 6) ☒ Claim(s) 5, 6, 11, 12 and 20-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5, 6, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,411,365 to Takeishi in view of U.S. Patent No. 5,477,304 to Nishi.

Takeishi discloses a scanning exposure apparatus for transferring a pattern of a master (reticle 13) onto a shot region while synchronously scanning the master and a substrate (wafer 16). FIG. 3 shows the apparatus including a master stage (reticle stage 12) for moving the master, a substrate stage (wafer stage 15) for moving the substrate, and a controller that controls the movement of the substrate stage over the shot region so as to assure a setting distance (settling distance X_s) during which the substrate and master stages will be synchronized after the substrate stage has reached a scan speed for the scanning exposure (col. 5 lines 10-18). FIG. 8 is a diagram of an embodiment in which the controller sets a predicted setting distance, and then records the actual setting distance and records it into a dynamic array, from which the next setting distance will be estimated (col. 6 line 44 – col. 7 line 7). As more and more points in the array are collected the setting distance for scans is optimized, becoming smaller and smaller (col. 7 lines 7-15). Takeishi teaches that the controller may be connected to substrate stage only (col. 7 lines 23-26). Takeishi does not include a teaching concerning an embodiment in which

imaging the substrate includes a plurality of shot regions, instead only including a description of an apparatus for imaging a substrate in a single scanning pass.

Nishi discloses a projection exposure apparatus including an embodiment in which a substrate is imaged using a plurality of shot regions (see FIGS. 11-12B and col. 18 line 28 – col. 19 line 10) in order to enable the apparatus to pattern a larger substrate. Therefore, it would have been obvious to use the scanning exposure apparatus of Takeishi to determine a setting distance for the shot regions of a stitch and scan system, like the one shown by Nishi, allowing the apparatus of Takeishi to pattern larger substrates, such as liquid crystal displays.

Referring specifically to claim 11, the above stated structure and function of Takeishi in view of Nishi would inherently lead to the method steps recited in these claims.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takeishi in view of Nishi as applied to claims 5, 6, and 11 above, and further in view of U.S. Patent No. 5,663,720 to Takahashi.

Although Takeishi does include a teaching of measuring the length of the setting distance, a specific method for doing so is not described. However, Takahashi describes a stage movement control apparatus that measures the length of the setting distance by ending the setting distance when the synchronization error falls to within an allowable range (see FIGS. 3a-3c). In view of the teaching of Takahashi, it would have been obvious to measure the setting distance of the substrate stage of the apparatus of Takeishi in view of Nishi by ending the setting distance when the synchronization error falls to within an allowable range as an art recognized method of measuring the setting distance.

The above stated structure and function of Takeishi in view of Nishi, and in further view of Takahashi, would inherently lead to the method steps recited in claim 12.

Claims 20-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeishi in view of Nishi as applied to claims 5, 6, and 11 above, and further in view of U.S. Patent Application Publication US 2001/0055100 A1 to Murakami.

Takeishi does teach that the scanning exposure apparatus may be used to manufacture a device (col. 3 lines 45-49). However, both Takeishi and Nishi are silent concerning the incorporating of the apparatus in a factory. Murakami discloses a factory for producing semiconductor devices using manufacturing apparatuses including adding a display, a network interface and a computer to the manufacturing apparatuses, connecting the apparatuses by a local area network, and communicating information about at least one of the apparatuses between the local area network and an external network. Murakami further includes the ability to access maintenance information by a user via the external network (FIGS. 5-9 and claims 18-24). Therefore, it would have been obvious to one skilled in the art to include the scanning exposure apparatus of Takeishi in view of Nishi in the factory system of Murakami as an art recognized use.

Allowable Subject Matter

Claims 1-4, 7-10, and 13-19 are allowed.

The following is an examiner's statement of reasons for allowance: A scanning exposure apparatus including a controller that sets the setting distance for a first shot region, exposed first

upon a change of a row of shot regions, to be longer than a setting distance for the successive shot regions in the row, including the rest of the structure and function of these claims, is not found in the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

Applicant's arguments filed 2/20/03 have been considered but are not persuasive.

Referring to Applicant's argument that Takeishi does not disclose using different setting times for different shot regions when using a region-by-region procedure for transferring a master pattern to a wafer, Examiner has previously acknowledged this to be true. Takeishi discloses using different setting times for different shot regions, and would thus create different setting times within the rows. Nishi is relied upon to show that it is well known in the art to use an exposure apparatus capable of performing exposures in shot regions to pattern a wafer in region-by-region procedure.

In reference to the argument that the method of Takeishi for determining a setting time for scan and stitch exposure would lead to a single setting time for use throughout the plurality of shot regions on a single wafer is not persuasive. Takeishi discloses an apparatus and method for determining a setting time for an exposure (see abstract), and allows for adjustment of the setting time from exposure to exposure. So using the method and apparatus and method of Takeishi for

patterning multiple exposures onto a single pattern would lead to an optimizing of the setting time from exposure to exposure, leading to the use of multiple setting times within a single wafer.

Regarding Applicant's objection to the Examiner's statement that the apparatus of Takeishi in view of Nishi would inherently lead to the methods described in claims 11 and 12. Examiner has described the apparatus in some detail and has explained how it is being applied to the apparatus claims. Examiner asserts that in order to use the apparatus, as it has been described, the method steps recited in these claims would have to be met. If Applicant feels that this is not the case Examiner suggests that Applicant point out specific steps that are not met by the references as applied.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Art Unit: 2851

Any inquiry concerning this communication or earlier communications from the examiner should be directed to D. Ben Esplin whose telephone number is (703) 305-4022. The examiner can normally be reached on Mon.-Fri. (8am-4:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russell E. Adams can be reached on (703) 308-2847. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.


DBE
April 14, 2003


RUSSELL ADAMS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800